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**LABORATORY**  
OF THE  
**INLAND REVENUE DEPARTMENT**  
OTTAWA, CANADA

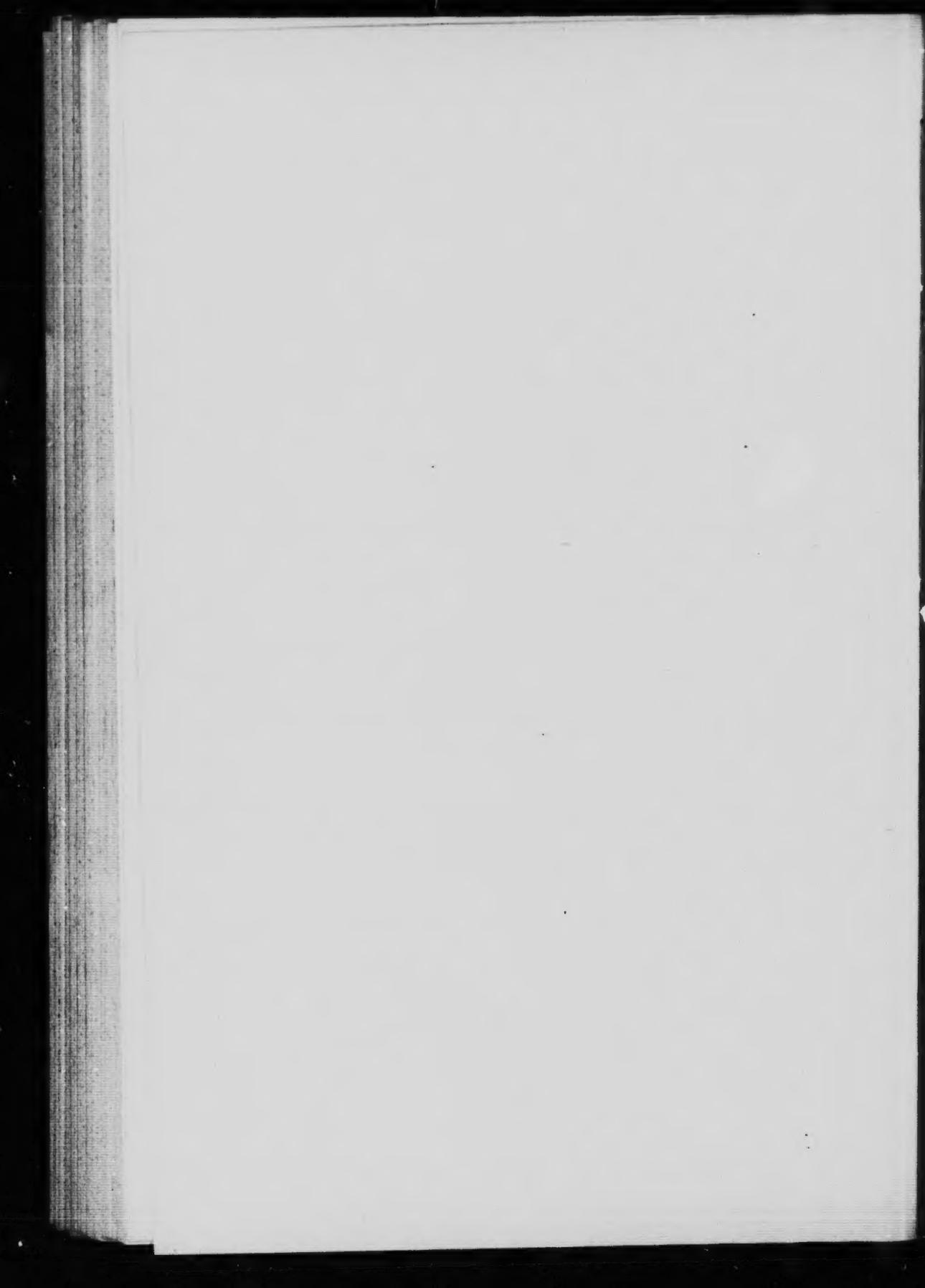
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**BULLETIN No. 211**

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**OIL OF TURPENTINE**

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BULLETIN No. 211

OIL OF TURPENTINE.

W. J. GERALD, Esq.,  
Deputy Minister of Inland Revenue.

OTTAWA, July 14, 1910.

SIR:—*Oil of Turpentine* (*Terebinthinae Oleum*) commonly called turpentine, is a drug recognized by the British and other Pharmacopoeias, and therefore comes within the scope of the Adulteration Act. It is a question whether the article, as employed in the arts, should be required to meet pharmacopoeal specifications; but until this point is settled, we must hold that "turpentine" means the turpentine of the pharmacopoeias.

The British Pharmacopoeia (Edn. 1898) thus describes the drug, "Limpid, colourless, with a strong peculiar odour which varies in the different kinds of oil, and a pungent and somewhat bitter taste. It is soluble in its own weight of glacial acetic acid. It commences to boil at about 320° F. (160° C.) and almost entirely distils below 350° F. (180° C.) or no residue remaining".

Squire's Com. (Edn. 1908) comments as follows:—"Rectified Oil of Turpentine has a sp. gr. of 0.860 to 0.880; the B.P. does not give a sp. gr.; the U.S.P. states 0.860 to 0.81. Boiling point 25° C. (77° F.); the P.G. 0.860 to 0.870. It boils at about 156° C. (312.8° F.), which is the figure given in the B.P. The P.G. states that it distils completely between 155° and 162° C. (311° and 323.6 F.). The B.P. states that it should distil almost entirely below 180° C. (356° F.). This temperature is considered (C. D. '98, ii. 55) to be too high, boiling at about 155° C. (311° F.) and at least 80 p. c. distilling below 165° C. (329° F.) would have been better.—The U.S.P. requires that the larger part of the oil should pass over between 155° and 162° C. (311° and 323.6° F.). The optical rotation of the oil may be either dextrogyrate or laevoogyrate. French Oil of Turpentine is strongly laevorotatory (-20° to -40° in a tube of 100mm. length). American Oil of Turpentine is dextrogyrate, the rotation usually varying from +9° to +14°. A 52 lb. quantity when fractionally distilled (C.D. '00, ii. 174) yielded up to 162.5 C. (324.5° F.) a distillate (91.2 p. c. of the whole) which was entirely dextrogyrate and from 162.5° to 190° C. (324.5° to 374° F.) fractions (amounting to 8.52 p. c.) which increased in laevorotation with the boiling point, namely from -0.8° to -10.3°. Neither the B.P. the U.S.P. nor the P.G. refers to the optical rotation. It is officially stated

to be soluble in its own volume of Glacial Acetic Acid. This test has been shown (P.J. '02, i.503) by the author and C. M. Caines to be practically *of no value* as a test for Oil of Turpentine, although useful as a test of the strength of Glacial Acetic Acid. An acid conforming strictly to the B.P. titration test (which requires a definite figure) cannot be expected to form a clear solution with all samples of Oil of Turpentine when mixed in equal volumes. Commercial samples of Glacial Acetic Acid which require more than the B.P. figure will mix readily without subsequent separation, and most of the commercial acids give a higher figure than the B.P. With such samples of Oil of Turpentine as had up to that time been examined the mixture of any of them in equal volumes with Glacial Acetic Acid, temperature 14.4° to 16.7° C. (58° to 62° F.) became a delicate test for a strength of 99.5 p. c. acid or stronger. The test is also referred to under Acidum Aceticum Glaciale.

The more generally occurring impurities are Petroleum, Paraffin Oils, Rosin, Rosin Oil, Petroleum Benzin, Kerosene Oil or similar hydrocarbons. Petroleum, Paraffin Oils or Rosin, if present, may be detected by the residue test. Kerosene or Rosin Oil, if present, by the evaporation test. Petroleum Benzin, Kerosene and similar hydrocarbons by the Sulphuric Acid test, each of which tests is described in small type below. Some work done in the laboratory of the Canadian Inland Revenue Department (C.D. '02, i.955) has resulted in the following definition of Oil of Turpentine, which must, however, be regarded as provisional, and subject to correction and amplification; it should be colourless, in thin layers, clear, but made decidedly opaque by shaking with 1.0 p. c. of water, and giving an opaque distillate of one-tenth volume which settles clear in a few hours. The peculiar and characteristic odour quite distinct from that of Gasolene, Rosin Oil, or Acetone. It has a sp. gr. between 0.860 and 0.880 (usually about 0.870). Samples which have been long exposed to the air have a higher density. The first 10 p. c. fraction has a sp. gr. of between 0.856 and 0.870 (usually about 0.860); the residual tenth should not exceed 0.900. The boiling point should lie between 154° and 158° C. (309.2° and 316.4° F.); nine-tenths should distil below 180° C. (356° F.). Fixed residue should not exceed 2 p. c., flash point about 32° C. (89.6° F.). The optical activity of the first fraction should increase in a plus direction by oxidation. The refractive index at 20° C. should lie between 1.4667 and 1.4722, that of the first fraction should not exceed 1.470. Moistened Starch Iodide paper should become blue when suspended over Turpentine exposed to the air, free Bromine in solution should be decolorised. Strong Sulphuric Acid should polymerize and char the sample at a boiling temperature, a rise of temperature should result on mixing with Sulphuric Acid."

The above may be taken as summing up all that is known of commercial turpentine, and it is amply evident that definitions and limits of variability are much needed. Reference is made to work done in this laboratory in 1901 (Bulletin 79). This consisted in an examination of 50 samples of commercial turpentine, having regard to the following properties:—

Physical characters—1. Colour.  
 2. Clearness.  
 3. Odor.  
 4. Taste.  
 5. Density.  
 6. Boiling point.  
 7. Volatility.  
 8. Vapor density.  
 9. Flash point.  
 10. Viscosity.  
 11. Solubility.  
 12. Solvent power.  
 13. Rotatory power for polarized light.  
 14. Refraction.  
 15. Fluorescence.  
 16. Oxidisability.

Chemical characters—17. Bromine absorption.  
 18. Rise of temperature with sulphuric acid.

The results of the examination referred to were summed up as follows, and having regard to a definition of Oil of Turpentine :—"Oil of Turpentine is a liquid, colourless—in thin layers, and having a yellow-red tint, equivalent to about 1 unit of yellow and 0.1 unit of red (Lovibond scale) when viewed in a column 2 dm. long. *Clear*—but made decidedly opaque by shaking with 0.1 per cent, water, and giving an *opaque*—distillate of one-tenth volume, which settles clear in a few hours. *Odour*—peculiar and characteristic, quite distinct from that of gasoline, rosin oil or acetone, and capable of distinguishing these odours to the extent of 10 per cent, admixture. *Density*—between 0.860 and 0.880, (usually about 0.870) but samples which have been long exposed to air may have a higher density. The *first fraction*—of one-tenth volume, has a density between 0.856 and 0.870 (usually about 0.860). The *residued tenth*—should not exceed 0.900. The *boiling point*—should lie between 154° and 158° C., and nine-tenths should distil below 180° C. The *fixed residue*—on evaporating over boiling water in a 4 inch, hemispherical dish, should not exceed 2 per cent. The viscosity, at 20° C., should be nearly 1.230 (water 1.000) McGill viscosimeter. *Flash point*—should be about 32° C. (Abel instrument). Should *dissolve*—completely in an equal volume of glacial acetic acid, and the first fraction should similarly dissolve. A *saturated solution*—of asphaltum should not be rendered translucent by dilution to ten volumes. (This test is best made by comparison with a sample of known purity.) The *optical activity*—of the first fraction should increase in a + direction by oxidation. The *refractive index*—at 20° C. should lie between 1.4667 and 1.4722. That of the first fraction should not exceed 1.4700. Moistened iodide of starch paper should become blue when suspended over turpentine exposed to air. *Free Bromine*—in solution (see section 17) should be decolorized. *Strong sulphuric acid*—should polymerize and char the sample at a boiling temperature. A *rise of temperature*—(see sec. 18), should result on mixing with sulphuric acid.

Experience since 1901 has shown that our knowledge of the article Commercial Turpentine is yet too indefinite and uncertain to be satisfactory. This is in part due to the nature and origin of the substance as known to commerce in the past. Turpentine is not a definite chemical substance, having a constant composition. It is the more volatile portions of the oleoresins derived from a number of different varieties of *Pinus*. Of later years, owing to the growing scarcity of pine forests, advantage has been taken of the fact that, by treatment in the dry way, or with superheated steam, a volatile product resembling turpentine is obtainable from pine, (roots, chips and other waste material). This article, commercially distinguished as wood-turpentine, (the original substance being called gum turpentine) resembles turpentine, and is even identical with turpentine in so many respects, that it has been found easy to market it under the same name.

But wood-turpentine, although having much in common with true turpentine is not really identical with it. This fact appears to be well known to, and recognized by the trade; and some of the chemical differences between the two are pointed out in a paper by me, contributed to the Society of Chemical Industry. (See *Jour. Soc. Chem. Indust.*, Vol. XXVI (1907) p. 847).

An important paper on turpentine was read before the Society of Public Analysts (London, England) by J. H. Coste, F.I.C. in 1908, and is published in the *Analyst*, Vol. XXXIII, p. 219. Speaking of turpentine Mr. Coste says :—"There is no doubt that much of the turpentine shipped to Europe from the United States is of a very different character from that which a few years ago was recognized as typical American Turpentine."

Another sophistication of turpentine consists in the addition to it of certain petroleum fractions, which are doubtless sold to greater profit in this than in any other way. The literature of this subject is very voluminous, and scattered. It is, moreover, very contradictory; many writers claiming that, as a solvent for use in paints and varnishes, the various substitutes for turpentine are little, if at all, inferior to the genuine article. It remains, however, that the name turpentine is supposed to stand for a certain and definite product; and it should be possible so to describe that product as to be able with certainty to distinguish between turpentine and its substitutes or imitations.

The report now submitted contains results obtained in the analysis of 75 samples of turpentine purchased in the markets of the Dominion, and of ten (10) samples, furnished by importers and others. These last are indicated by letters. Table I (parts 1 and 2) gives the source of the samples, and the results of analysis. Table II makes a selection of 29 samples which are apparently genuine gum turpentine as judged by the whole results of analysis.

In connection with the results here shown it is important to note as follows:—

1. The percentage weight of Iodine taken up, approximates 370; which number was regarded as typical by Worstell (Jour. Soc. Chem. Indust., 1904, 302), and corroborated by myself (J.S.C.I. XXVI) the Hübl solution being employed.
2. The undissolved (unpolymerized) residue, on treatment of 10 cc with 40 cc. of a sulphuric acid containing 20 per cent of the fuming acid, seldom exceeds 10 per cent of the sample.
3. The refractive index of this residue lies between 1.4950 and 1.5000; read at 20° C.
4. The refractive index of the sample is about 1.4700 at 20° C.
5. The specific gravity (15.5°C.) is about 0.870.
6. The initial boiling point is not lower than 150°C. under ordinary pressure; and the greater part (at least 75 per cent volume) distils below 160°C.
7. The middle fraction of 50 per cent volume, distils between 156° and 159°C., in most samples.
8. Ninety per cent by volume distils below 165° C., in most samples.
9. The refractive index of the second fraction of 25 per cent volume, is between 1.4685 and 1.4700; and that of the third fraction of 25 per cent is practically 1.4700.
10. The flash point lies between 31°C. and 34°C.

Table III contains the results of examination of nine (9) samples, furnished by various interested parties, and suspected, for one reason or another, to be surrogate. It is unfortunate that very small quantities were supplied in most cases, hence the record is less complete than could be wished. So far as it goes, it may be noted, in contrast to the general conclusions reached for genuine turpentine, that, (1) the Iodine number is decidedly below 370; (2) the unpolymerized residue in the first 7 samples falls within the limit for turpentine, while in I & K, the residue exceeds 40 per cent. (3) The refractive index for the first 7 samples, falls within the limits for turpentine, while samples I & K, show a much lower refraction. (4) The same holds true of the refraction of the sample itself. (5) The specific gravity of the first 5 samples is indistinguishable from that of turpentine; for samples F & G it is quite too high; and for K it is abnormally low. (6) Initial boiling point and temperature for distillation of 75 per cent indicate a variation from true turpentine especially notable in samples I & K. (7) The limits of temperature for distillation of middle fraction of 50 p. c., are pronouncedly different from those for genuine turpentine. (8) Limit temperature for 90 per cent distillate is too high. (9) The flash point does not serve to distinguish from genuine turpentine.

This study, interpreted in the light of our knowledge of wood-turpentine and of petroleum, justifies the conclusions that the first seven samples in this table (A to G) are essentially wood turpentines; while samples I & K, are mixtures containing considerable amounts of petroleums.

This report shows that a considerable amount of adulterated turpentine is found on the market in Canada. The adulteration chiefly consists in additions of petroleum fractions; but, in some instances it is due to substitution by, or addition of wood turpentine.

Wood turpentine is apparently more closely related to turpentine than are petroleums. It is claimed that certain substitutes for turpentine have equal value with the genuine article, for use in the arts. With this aspect of the question, we have nothing to do. It is the duty of this Department to require that nothing else than true turpen-

tine shall be offered for sale, or sold, under that name. The sale of wood turpentine or of petroleum mixtures for paint and varnish manufacture, and for other uses in the arts, may possibly be desirable; but such articles should not be sold under the name turpentine.

I believe that the information herein given will be helpful in enabling a clear and workable definition of turpentine to be made; and I beg to recommend its publication as Bulletin No. 211.

I have the honour to be, sir,  
Your obedient servant,

A. MCGILL,  
- Chief Analyst.

TABLE I, (PART I) BULL. 211—TURPENTINE.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	Inspector's Report. (Is not an expression of opinion.)	No. of Sample.
				Quantity.	Cent.			
1910.	Turpentine.....	41941	Wm. Robertson & Son, Halifax, N.S.	3 pts.	50	Carolina Pine Product Co., Cleveland, Ohio.	.....	41941
"	"	41942	A. M. Bell & Co., Halifax, N.S.	3 "	37	Unknown.	Sold as American Turpentine.	41942
"	"	41943	Crowell Bros., Halifax, N.S.	3 "	35	W. B. Dicks, London, Eng.	.....	41943
"	"	41944	Martin & Moore, Halifax, N.S.	3 "	36	Imperial Oil Co., Halifax	Georgia Pure Turpentine.	41944
"	"	41945	A. L. Melvin & Co., Halifax, N.S.	3 "	35	Carolina Pine Product Co., Halifax, N.S.	.....	41945

## DISTRICT OF NOVA SCOTIA—R. J. WAUGH, INSPECTOR.

Mar. 7	Turpentine.....	38626	Stanley Shaw & Reardon, Charlotte- town.	3 pts.	37	A. Ramsay & Co., Montreal.	.....	38626
" 9	"	38627	R. Tuplin & Co., Kensington.	3 "	38	Carolina Pine Product Co., Cleveland, Ohio	.....	38627
" 10	"	38628	R. T. Holman Ltd., Summerside	3 "	40	"	.....	38628
" 12	"	38629	S. W. Crable, Charlottetown.	3 "	40	A. Jameison & Co., Montreal	.....	38629
" 15	"	38630	Sterns Bros., Souris.	3 "	40	Rogers Hardware Co., Charlottetown	.....	38630

## DISTRICT OF PRINCE EDWARD ISLAND—THEO. MOORE, INSPECTOR.

Mar. 7	Turpentine.....	38626	Stanley Shaw & Reardon, Charlotte- town.	3 pts.	37	A. Ramsay & Co., Montreal.	.....	38626
" 9	"	38627	R. Tuplin & Co., Kensington.	3 "	38	Carolina Pine Product Co., Cleveland, Ohio	.....	38627
" 10	"	38628	R. T. Holman Ltd., Summerside	3 "	40	"	.....	38628
" 12	"	38629	S. W. Crable, Charlottetown.	3 "	40	A. Jameison & Co., Montreal	.....	38629
" 15	"	38630	Sterns Bros., Souris.	3 "	40	Rogers Hardware Co., Charlottetown	.....	38630

DISTRICT OF NEW BRUNSWICK—J. C. FERGUSON, INSPECTOR.

Mar.	3	Turpentine.....	29640	Robertson, Foster & Smith, Ltd., St. John, N.B.	3 pts.	45	Standard Oil Co., N.Y., De B. Carrithers, Agent, St. John.	.....	39640
"	7	"	39641	W. H. Thorne & Co., Ltd., St. John, N.B.	3 "	45	De B. Carrithers, St. John, N.B.	.....	39641
"	9	"	39642	T. McAvity & Sons Ltd., St. John, N.B.	3 "	60	North Carolina Pine Varnish Co., U.S.A.	.....	39642
"	13	"	39643	Tweedale & Co., Fredericton, N.B.	3 "	45	Imperial Oil Co., St. John, N.B.	.....	39643
Apr.	6	"	39644	Summer Co., Moncton, N.B.	3 "	30	Carolina Pine Product Co., Montreal.	.....	39644

DISTRICT OF QUEBEC—E. BELAND, INSPECTOR.

Mar.	8	Turpentine.....	36523	T. M. Tardivel, 34 Rue Desjardine, Quebec.	3 pts.	45	The Georgia Turpentine Co., Montreal.	.....	36523
"	8	"	36524	B. Leonard, 53 Rue St. Jean, Quebec.	3 "	36	Unknown.	.....	36524
"	8	"	36525	Marier & Tramblay, 71 Rue du Pont, Quebec.	3 "	39	Carolina Pine Production.	.....	36525
"	8	"	36526	Simard & Freire, 270 Rue St. Joseph, Quebec.	3 "	42	Unknown.	.....	36526
"	8	"	36527	La Comp. Gauthier, 287 Rue St. Joseph, Quebec.	3 "	45	Imperial Oil Co., Quebec.	.....	36527

DISTRICT OF ST. HYACINTHE—J. C. ROULEAU, INSPECTOR.

Mar.	3	Turpentine.....	1256	J. Seneca, Stanbridge Station.	1 1/2 pt..	20	Unknown	.....	1256
"	7	"	1257	Hill & Depatie, St. Armand	3 pts.	45	Sherwin Williams, Montreal.	.....	1257
"	7	"	1258	G. E. N. Pepin, Drummondville	3 "	40	Imperial Oil Co., Montreal	.....	1258
"	18	"	1259	A. Daveluy & fils, Daveleyville	1 pt..	25	Frothing & Workman.	.....	1259
			1260	S. Bourgeois & Cie, St. Hyacinthe.	3 pts..	33	Carolina Pine Products Co., Savannah, Ga.	.....	1260

TABLE I. (PART I) BULL. 211—TURPENTINE—Continued.

Date of Collection	No.	Nature of Sample	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	Inspector's Report (Is not an expression of opinion).	No. of Sample
				Quantity	Cent.			
1910.	9	Turpentine.....	40442 B. Beaupin, St. Jerome, P.Q. ....	3 pds.	45	Imperial Oil Co., Montreal.....	40442	
"	9	"	40443 C. E. Lefebvre, St. Jerome, P.Q. ....	3 "	45	.....	40443	
"	14	"	40444 Wall Bros., 67 Bleury St., Montreal.....	3 "	40	Canada Paint Co., Ltd., Montreal.....	40444	
"	14	"	40445 E. D. Colerette & Co., 36 Bleury St., Montreal.....	3 "	45	.....	40445	
"	14	"	40446 Beauvais et frere, 396 St. Lawrence B., Montreal.....	3 "	40	.....	40446	

## DISTRICT OF MONTREAL—J. J. COSTIGAN, INSPECTOR.

Mar.	Date	Nature of Sample	Name and Address of Vendor.	Cost.	Inspector's Report (Is not an expression of opinion).
15	1910.	Turpentine.....	42942 George Higman Son & Co., Ottawa.....	3 bats.	45 Ottawa Paint Works, Ottawa.....
"	"	"	42943 William Howe, Rideau St., Ottawa.....	3 "	25 Southern States Turpentine Co., Cleveland, Ohio.....
"	"	"	42944 J. B. Duford, Ottawa.....	3 "	38 W. G. Charlton, Ottawa.....
"	"	"	42945 The Ottawa Paint Works, Ottawa.....	3 "	38 Am. Naval Stores Co., New York.....
"	"	"	42946 John Storr, Ottawa .....	3 "	38 Southern States Turpentine Co., Cleveland, Ohio.....

## DISTRICT OF OTTAWA—J. A. RICKY, INSPECTOR.

Mar.	Date	Nature of Sample	Name and Address of Vendor.	Cost.	Inspector's Report (Is not an expression of opinion).
15	1910.	Turpentine.....	42942 George Higman Son & Co., Ottawa.....	3 bats.	45 Ottawa Paint Works, Ottawa.....
"	"	"	42943 William Howe, Rideau St., Ottawa.....	3 "	25 Southern States Turpentine Co., Cleveland, Ohio.....
"	"	"	42944 J. B. Duford, Ottawa.....	3 "	38 W. G. Charlton, Ottawa.....
"	"	"	42945 The Ottawa Paint Works, Ottawa.....	3 "	38 Am. Naval Stores Co., New York.....
"	"	"	42946 John Storr, Ottawa .....	3 "	38 Southern States Turpentine Co., Cleveland, Ohio.....

**DISTRICT OF KINGSTON—JAS. HOGAN, INSPECTOR.**

Mar.	1	Turpentine.....	44201	J. Nugent, Kingston.....	3 pts..	50	Queen City Oil Co., Kingston.....	44201
"	1	".....	44202	J. B. Bunt, Kingston.....	3 "	45	A. Chown, Kingston.....	44202
"	1	".....	44203	W. Mitchell, Kingston.....	3 "	50	North Carolina Production Co., Montreal.....	44203
"	1	".....	44204	A. Chown & Co., Kingston.....	3 "	36	New York Agent, Direct from Havanna.	44204
"	1	".....	44256	A. B. Dalton & Sons, Kingston.....	3 "	40	Am. Navy Stores New York.....	44256

DISTRICT OF TORONTO—H. J. DAGER, INSPECTOR

2 Turpentine.....	41399	Geo. Pearshall & Son, 417 Yonge St., 8 pta. Toronto.	45	The Queen City Oil Co., Ltd., Toronto.
2 "	41400	W. C. McFarland, 391-393 Parliament St., Toronto.	50	J. H. Morrin & Co., Toronto.....
4 "	41401	J. M. B. Stephens, New Market.....	50	Brandram & Henderson, Montreal.....
7 "	41498	Thomas Ramsay, Market Square, 3 "..... Hamilton.	37	Carolina Pine Products Co., Cleve- land, Ohio.
8 "	41499	Alexander Hardwate Co., Ltd., King St., St. E., Hamilton.	40	A. Ramsay & Son, Montreal.....

**DISTRICT OF LONDON—T. KIDD, INSPECTOR**

Mar. 15	Turpentine	44731	— Howell, Goderich	1	pt.	20	Canada Paint Co.	44731
" 18	"	44732	Matt. Williams, Seaforth.	3bota.	30	Gorman & Eckert, London		44732
Apr. 11	"	44736	W. Barley, Mitchell	3 "	30	Unknown		44736
" 19	"	44745	Will. Bartlett, St. Mary's.	1½ pt.	15	Sanders & Percy, Toronto.		44745
" 19	"	44748	J. Minnes, Hardware Merchant, Fergus.	1 pt.	20	"	"	44748

TABLE I, (PART I) BULL. 211—TURPENTINE—Continued.

Date of Collection	Sample No.	Nature of Sample	Name and Address of Vendor	Cost	Inspector's Report.	
					(In not an expression of opinion.)	
X <sub>6</sub> of sample						
DISTRICT OF WINDSOR—JNO. TALBOT, INSPECTOR.						
1910.						
Mar.	2	Turpentine.....	42501 Kilpatrick Bros., London, Ont.....	3 lbs.	30 Hobbs Hardware Co., London, Ont.....	12501
"	2	"	42502 Robert Parson, London, Ont.....	3 "	30 D. H. Howden Co., London, Ont.....	42502
"	2	"	42503 McLean Hardware Co., London, Ont.....	3 "	30 D. H. Howden Co., London, Ont.....	42503
"	2	"	42504 Pundow Hardware Co., London, Ont. 3 "	30 Am. Naval Stores, Detroit.....	12	42504
"	2	"	42505 W. B. Gillespie, London, Ont.....	3 "	30 D. H. Howden & Co., London.....	42505
"	2	"				
DISTRICT OF MANITOBA—A. C. LARIVIÈRE, INSPECTOR.						
1910.						
Mar.	15	Turpentine.....	38871 Linklater Bros. & Elder, Winnipeg, ".....	50	G. F. Stephens & Co., Winnipeg.....	38871
"	15	"	38872 C. Tadman, Winnipeg.....	50	"	38872
"	15	"	38873 The Bee Hive, Winnipeg.....	45	"	38873
"	15	"	38874 The Lemox Hardware Co., Winni-3 "	50	Unknown.....	38874
"	15	"	38875 Wm. Johnson, Winnipeg.....	3 "	45 "	38875
"	15	"				
DISTRICT OF CALGARY—R. W. FLETCHER, INSPECTOR.						
1910.						
Mar.	15	Turpentine.....	35637 J. J. Hewit, Medicine Hat.....	3 lbs.	60 Canada Paint Co., Montreal.....	34837
"	17	"	35638 Linton & Hall, Calgary.....	3 "	60 Imperial Oil Co., Calgary.....	35637
"	17	"	35639 Corner Hardware Co., Ltd., Calgary.....	3 "	60 Marshall Wells Co., Winnipeg.....	35638

" 17	"	35640 The J. H. Ashdown Hardware Co., 3 "	60 Imperial Oil Co., Calgary
" 18	"	35641 T. R. Stuart & Co., Calgary	66 G. F. Stephens Co., Calgary

## DISTRICT OF VANCOUVER—J. F. POWER, INSPECTOR.

Mar. 15	Turpentine	37853 J. A. Flett, Vancouver	3 pts. 40 Imperial Oil Co., Victoria, B.C.
" 15	"	37854 Wood, Vallance & Leggett, Vancouver	3 " 40 " " "
" 15	"	37855 Fraser Hardware Co., Vancouver	3 " 55 " " "
" 15	"	37856 Abercrombie Hardware Co., Vancouver	3 " 50 " " "
" 15	"	37857 Bonnell Hardware Co., Vancouver	3 " 55 " " "

## DISTRICT OF VICTORIA—D. OSULLIVAN, INSPECTOR.

Mar. 21	Turpentine	41674 The Staneland Co., Victoria, B.C.	3 pts. 50 Imperial Oil Co.
" 21	"	41675 Mellor Bros., Ltd., Victoria, B.C.	3 " 60 " " "
" 21	"	41676 Melrose Paint Co., Victoria, B.C.	3 " 40 " " "
" 21	"	41677 J. L. Forister, Victoria, B.C.	3 " 45 British Am. Paint Co., Victoria, B.C.
" 21	"	41678 British Am. Paint Co., Victoria, B.C.	3 " 40 Imperial Oil Co., Vancouver, B.C.
"	"	A	" " " " "
"	"	B Canada Turpentine Co., per E. Fielding	Steam process, Wood Turpentine
"	"	C Canada Turpentine Co., per R. Munroe.	" " "
"	"	D Cacillac Turpentine Co., per E. Fielding.	No. 1 Grade Steam Process Wood Turpentine.
"	"	E E. Fielding.	Wood Turpentine from Georgia
"	"	F	" " "
"	"	G	" " "
"	"	H	" " "
"	"	I	" " "
"	"	J	" " "
"	"	K Summer Co., Moncton, N.B. L. 70451.	" " "

K.

TABLE I, (PART II) BULL.

## RESULTS OF

Name of Inspectoral District.	Number of Sample.	Hub Iodine Number.	Initial Residue from 10 cc. with 40cc. H <sub>2</sub> S <sub>2</sub> 4 Cone. 1 fun.	Ref. Index 20° of Insoluble Residue.	Ref. Index 20° of Turpentine.	Sp. Gr. 15° 5 of Turpentine.	Distillation Temp. 1st 25 cc. from 100 cc.	2nd 25 cc.	3rd 25 cc.	Next 15 cc.	Ref. Index Fraction 1st 25 cc. Distil- late.
Nova Scotia.....	41941 290·4	3·0	1·4667 1·4668	8594 150 - 160 160 - 165 165 - 174 175 - 197	1·4620						
	41942 293·4	2·1	1·4687 1·4678	8634 154 - 160 160 - 164 164 - 173 173 - 202	1·4642						
	41943 308·1	8	1·4898 1·4720	8637 159 - 162 162 - 164 164 - 167 167 - 172	1·4695						
	41944 377·5	65	1·4967 1·4719	8746 153 - 157 157 - 158 158 - 159	1·4692						
	41945 251·5	3·5	1·4643 1·4660	8576 154 - 160 160 - 166 166 - 174 174 - 215	1·4621						
Prince Edward Island	38626 372·3	75	1·4994 1·4703	8710 150 - 156 156 - 157 157 - 158 158 - 163	1·4680						
	38627 223·0	3·85	1·4596 1·4640	8573 148 - 158 158 - 166 166 - 180 180 - 227	1·4664						
	38628 351·2	1·5	1·4849 1·4692	8652 154 - 157 157 - 158 158 - 159 159 - 165	1·4680						
	38629 386·9	1·05	1·4996 1·4708	8684 152 - 156 156 - 157 157 - 158 158 - 161	1·4687						
	38630 369·2	7	1·4991 1·4717	8750 154 - 157 157 - 158 158 - 161 161 - 171	1·4680						
New Brunswick.....	39040 335·5	1·35	1·4865 1·4686	8670 145 - 156 156 - 157 157 - 158 158 - 164	1·4628						
	39641 368·9	9	1·5006 1·4710	8718 154 - 157 157 - 157 157 - 159 159 - 160	1·4600						
	39642 363·5	1·3	1·4874 1·4686	8663 149 - 156 155 - 157 157 - 159 159 - 163	1·4624						
	39643 363·4	1·06	1·4820 1·4688	8657 145 - 156 156 - 158 158 - 159	1·4619						
	39644 200·7	3·6	1·4678 1·4658	8589 152 - 159 160 - 164 164 - 177 177 - 210	1·4624						
Quebec.....	36523 330·2	95	1·4905 1·4714	8747 152 - 156 156 - 158 158 - 160 160 - 160	1·4678						
	36524 289·6	4·06	1·4483 1·4559	8366 110 - 148 148 - 154 154 - 158 158 - 162	1·4322						
	36525 295·8	2·65	1·4614 1·4657	8589 152 - 158 158 - 161 161 - 166 166 - 178	1·4628						
	36526 365·8	1·06	1·5000 1·4706	8692 153 - 157 157 - 158 158 - 168 158 - 158	1·4686						
	36527 290·8	3·05	1·4524 1·4553	8339 120 - 144 144 - 152 152 - 157 157 - 161	1·4356						
St. Hyacinthe.....	1256 256·2	3·9	1·4032 1·4628	8607 153 - 160 160 - 163 163 - 172 172 - 193	1·4582						
	1257 345·0	75	1·4980 1·4714	8739 154 - 158 159 - 158 158 - 160 160 - 166	1·4689						
	1258 350·3	85	1·4932 1·4731	8870 150 - 157 157 - 159 159 - 165 165 - 210	1·4679						
	1259 246·5	3·9	1·4673 1·4655	8579 154 - 162 162 - 167 167 - 181 181 - 227	1·4617						
	1260 241·2	2·9	1·4481 1·4654	8576 151 - 161 161 - 168 168 - 177 177 - 215	1·4587						
Montreal.....	40442 341·1	65	1·4936 1·4730	8674 152 - 157 157 - 160 160 - 164 165 - 205	1·4678						
	40443 373·8	82	1·4997 1·4718	8738 152 - 156 156 - 156 156 - 160 160 - 167	1·4681						
	40444 365·4	6	1·4826 1·4700	8683 150 - 155 155 - 156 156 - 158 158 - 162	1·4672						
	40445 369·1	1·0	1·4903 1·4702	8707 150 - 156 156 - 158 158 - 159	1·4667						
	40446 368·9	1·3	1·4887 1·4687	8660 152 - 156 156 - 157 157 - 159 159 - 162	1·4667						
Ottawa.....	42942 366·6	1·0	1·5012 1·4703	8691 149 - 156 156 - 156 156 - 158 158 - 159	1·4697						
	42943 366·0	2·5	1·4695 1·4660	8668 150 - 156 156 - 158 158 - 160 160 - 175	1·4633						
	42944 276·0	2·5	1·4688 1·4661	8615 152 - 156 156 - 159 159 - 165 165 - 175	1·4634						
	42945 376·8	1·1	1·5010 1·4716	8681 155 - 157 157 - 159 159 - 160 160 - 161	1·4702						
Kingston.....	42946 295·7	2·8	1·4606 1·4657	8595 152 - 157 158 - 160 160 - 164 164 - 174	1·4628						
	44201 360·4	1·3	1·4994 1·4704	8706 155 - 157 157 - 158 158 - 160 160 - 168	1·4693						
	44202 337·3	1·0	1·4956 1·4714	8754 152 - 157 157 - 158 158 - 159 160 - 168	1·4693						
	44203 250·8	3·8	1·4653 1·4658	8570 150 - 160 160 - 165 165 - 179 179 - 227	1·4612						
	44205 373·2	8	1·4984 1·4714	8748 150 - 157 157 - 158 158 - 160 160 - 168	1·4686						
Toronto.....	44256 369·5	1·0	1·5000 1·4716	8606 155 - 157 158 - 158 158 - 159 159 - 161	1·4698						
	41309 382·2	1·0	1·4977 1·4701	80° 153 - 156 156 - 156 156 - 157 157 - 162	1·4679						
	41400 365·3	1·1	1·4914 1·4697	8669 152 - 157 157 - 158 158 - 159 159 - 162	1·4664						
	41497 351·6	95	1·4977 1·4715	8720 155 - 157 157 - 158 158 - 159 159 - 163	1·4702						
	41498 237·3	3·8	1·4604 1·4643	8582 145 - 159 159 - 166 166 - 176 176 - 220	1·4560						
	41499 395·0	95	1·5000 1·4703	8688 153 - 155 155 - 155 155 - 158	1·4687						
London.....	44731 358·1	95	1·5008 1·4714	8706 151 - 156 156 - 158 158 - 159 159 - 163	1·4690						
	*44733 358·0	9	1·4987 1·4696	8692							
	44736 363·9	75	1·5014 1·4718	8819 153 - 156 156 - 157 157 - 160 160 - 176	1·4686						
	44745 375·1	6	1·4952 1·4716	8681 153 - 156 156 - 157 157 - 157 157 - 162	1·4678						
	44748										
Windsor.....	42501 360·1	8	1·4923 1·4702	8698 152 - 157 157 - 157 157 - 158 158 - 163	1·4686						
	42502 393·7	65	1·4994 1·4706	8699 153 - 155 155 - 156 156 - 157 157 - 162	1·4686						
	42503 392·0	7	1·4997 1·4700	8679 153 - 156 156 - 157 157 - 157 157 - 159	1·4687						
	42504 380·5	65	1·4993 1·4705	8702 152 - 155 155 - 156 156 - 158 158 - 162	1·4687						
	42505 375·6	6	1·4974 1·4700	8678 150 - 156 156 - 156 156 - 157	1·4688						

\* Small sample

† Sample in dirty bottle and therefore not worked.

## 211—TURPENTINE.

## ANALYSIS.

Fraction 2nd 25 cc.	Fraction 3rd 25 cc.	Fraction 4th 15 cc.	Residue of 10 cc.	DISTILLATION TEMPERATURE OF 90 CC. FROM 100.										Number of Sample.	Remarks and Opinion of the Chief Analyst.									
				Under 160°		160°-154°		155°-159°		160°-164°		165°-169°		170°-174°		175°-179°		180°-184°		185°-189°		190°-194°		195°-199°
1·4651	1·4671	1·4680	1·4775	3	18	29	17	8	4	5	3	2	2	1	1	34	0	41941	Contains petroleum.					
1·4659	1·46	1·4696	1·4818	1	21	34	14	8	4	3	2	1	1	1	1	36	5	41942	"					
1·4704	1·4717	1·4738	1·4838	1	5	31	6									38	5	41943	Wood turpentine.					
1·4696	1·4703		1·4800	1	15	27	18	11	7	2	1	1	1	0		33	5	41944	Genuine.					
1·4644	1·4663	1·4672	1·4793		0	57	8									36	5	41945	Contains petroleum.					
1·4690	1·4693	1·4707	1·4889		3	7	23	14	18	6	5	1	4	1	9	32	5	38626	Genuine.					
1·4627	1·4653	1·4683	1·4926		2	30	8									38	27	38627	Contains petroleum.					
1·4691	1·4692	1·4703	1·4750		3	83	4									34	5	38628	Doubtful.					
1·4694	1·4700	1·4704	1·4820		2	67	16	3	1							33		38629	Genuine.					
1·4698	1·4702	1·4719	1·5006		2	17	6	3								34	5	38630	"					
1·4676	1·4693	1·4713	1·4909		1	78	11									29		39640	Doubtful.					
1·4607	1·4702	1·4714	1·4894		3	17	61	9								33	5	39641	Genuine.					
1·4677	1·4694	1·4713	1·4887		1	4790										27		39642	Doubtful.					
1·4676	1·4696				5	20	24	13	7	5	3	2	2	4	1	35		39643	"					
1·4654	1·4666	1·4673	1·4788		5	70	12	3								32	5	39644	Contains petroleum.					
1·4605	1·4702	1·4715	1·4976		32	23	32	3								12		39523	Doubtful.					
1·4550	1·4636	1·4677	1·4800		1	4660	1·4673	1·4747	3	36	30	15	5	1		33		36524	Contains petroleum.					
1·4638	1·4702	1·4720	1·4832		1	476	28									32	5	36525	"					
1·4516	1·4620	1·4676	1·4813		41	21	25	3								9		36526	Genuine.					
1·4603	1·4611	1·4608	1·5074		2	23	34	11	9	5	1	2	3			37		36527	Contains petroleum.					
1·4790	1·4704	1·4718	1·4937		2	69	18	1								34		1256	"					
1·4707	1·4689	1·4774	1·5166		7	50	18	5	4	2	1	1	1		2	33	5	1257	Genuine.					
1·4644	1·4659	1·4679	1·4800		3	12	26	15	12	3	4	3	1	0		37		1258	Doubtful.					
1·4640	1·4664	1·4682	1·4839		4	17	17	16	13	10	5	1	1	1	15	36		1259	Contains petroleum.					
1·4694	1·4707	1·4767	1·5196		10	38	27	6	5	1	1	1	1	1		35		40442	Doubtful					
1·4688	1·4702	1·4719	1·4974		5	68	14	3								33	5	40443	Genuine.					
1·4690	1·4700	1·4710	1·4846		10	73	7									31	5	40444	Doubtful.					
1·4687	1·4696		1·4792													31	5	40445	Genuine.					
1·4684	1·4686	1·4708	1·4779		5	75	10									32		40446	"					
1·4702	1·4704	1·4717	1·4813		1	8	81									35	5	42942	Doubtful.					
1·4655	1·4664	1·4674	1·4806		13	54	18	4	1							33		42943	Contains petroleum.					
1·4650	1·4674	1·4677	1·4790		10	47	18	11	4							34		42944	"					
1·4704	1·4710	1·4724	1·4789		0	73	17									34	5	42945	Genuine.					
1·4658	1·4602	1·4670	1·4760		7	44	28	8	3							33	5	42946	Contains petroleum.					
1·4692	1·4701	1·4712	1·4868		69	17	4									33	5	41201	Doubtful.					
1·4696	1·4702	1·4721	1·4947		4	71	13	2								34	5	44202	"					
1·4642	1·4663	1·4676	1·4805		4	18	28	11	10	9	3	2				35		44203	Contains petroleum.					
1·4694	1·4700	1·4716	1·4963		66	18	2									33	5	44205	Genuine.					
1·4701	1·4708	1·4718	1·4908		83	7										34		44256	"					
1·4690	1·4696	1·4703	1·4873		4	83	3									32	5	41399	"					
1·4694	1·4706	1·4718	1·4812		5	71	14									31		41400	"					
1·4703	1·4713	1·4726	1·4883		77	13										34	5	41487	Doubtful.					
1·4616	1·4646	1·4674	1·4894		3	14	17	14	15	9	6	2	2	1	2	3	34	5	41498	Contains petroleum.				
1·4690	1·4696		1·4750													33	5	41499	Genuine.					
1·4702	1·4710	1·4723	1·4897		5	76	9									34	5	44731	Doubtful.					
1·4697	1·4702	1·4727	1·5053		5	69	5	8	2	1						28	0	44733	"					
1·4689	1·4693	1·4708	1·4836		5	80	5									34	5	44736	Genuine.					
1·4690	1·4702	1·4707	1·4813		11	70	9									34	5	44745	"					
1·5088	1·4700	1·4713	1·4886		6	80	4									34	5	44748	Not worked.					
1·4690	1·4698	1·4710	1·4796		5	85										32	5	42501	Doubtful.					
1·4691	1·4698	1·4713	1·4878		5	78	7									33	0	42502	Genuine.					
1·4691	1·4700		1·4740													33	5	42503	"					
																33	5	42504	"					
																33	5	42505	"					

TABLE I, (PART II) BULL.

## RESULTS OF

Name of Inspectoral District.	Number of Sample.	Hbd. Iodine Number.	Insol. Residue from 10 cc. with 40 cc. H <sub>2</sub> SO <sub>4</sub> , 4 Cone. 1 min.	Ref. Index 20° of Insoluble Residue.	Ref. Index 20° of Turpentine.	Sp. gr. 15.5 of Tur- pentine.	Distillation Temp. 1st 25 cc. from 100 cc.		3rd 25 cc.		Ref. Index 1st 25 cc. Distillate.
							1st 25 cc.	2nd 25 cc.	3rd 25 cc.	Neat 15 cc.	
Manitoba . . . . .	39871 380-8	1.15 1.4935 1.4704	8681 152-157 157-157 157-158 158-163	1.4679							
	39872 373-2	1.95 1.4922 1.4699	8697 152-155 155-156 156-157 157-162	1.4673							
	39873 341-1	1.15 1.4906 1.4702	8698 152-155 155-156 156-158 158-160	1.4676							
	39874 359-6	1.95 1.4959 1.5705	8726 150-155 155-156 156-158 158-164	1.4667							
	39875 361-7	1.9 1.4927 1.4704	8732 152-156 156-156 157-157 159-159	1.4668							
Calgary . . . . .	35637 380-9	1.75 1.4954 1.4707	8722 149-156 156-156 156-156 159-159	1.4668							
	35638 358-3	1.95 1.4936 1.4702	8662 148-155 155-157 157-157 158-158	1.4658							
	35639 354-6	1.85 1.4934 1.4703	8729 152-157 157-157 158-158 160-160	1.4672							
	35640 368-8	1.0 1.4918 1.4694	8685 146-156 156-156 157-157 159-159	1.4676							
Vancouver . . . . .	35641 367-4	1.95 1.4945 1.4701	8719 152-156 156-157 157-157 157-157	1.4667							
	37853 298-6	2.6 1.4650 1.4650	8586 145-157 157-161 161-169 170-225	1.4584							
	37854 368-1	1.65 1.4990 1.4703	8684 155-157 157-157 157-158	1.4687							
	37855 272-5	3.3 1.4596 1.4631	8534 140-158 158-162 162-175 175-210	1.4570							
	37856 345-1	1.7 1.4984 1.4703	8694 152-156 156-156 156-158	1.4690							
Victoria . . . . .	37857 368-8	1.75 1.4976 1.4702	8679 152-155 155-156 156-157	1.4674							
	41673 367-1	1.7 1.4804 1.4686	8661 140-152 152-154 154-156	1.4606							
	41675 352-0	1.95 1.4779 1.4682	8653 140-155 155-158 158-159	1.4610							
	41676 299-0	2.85 1.4615 1.4645	8548 140-157 157-161 161-172	1.4570							
	41677 284-0	3.2 1.4620 1.4637	8538 145-158 158-162 162-174	1.4572							
	41678 369-6	1.85 1.4944 1.4680	8653 140-155 155-157 157-159	1.4602							
	A 205-8	1.3 1.4913 1.4704	8705 155-160 160-162 162-167 167-176	1.4677							
	B 344-4	1.7 1.4986 1.4678	8681								
	C 317-1	1.9 1.4948 1.4696	8664								
	D 331-5	1.9 1.4884 1.4678	8670								
	E 349-1	1.55 1.4971 1.4688	8700								
	F 290-3	1.6 1.4947 1.4750	9065								
	G 247-8	1.35 1.5013 1.4800	9288								
	H 372-5	1.0 1.5003 1.4702	155-157 157-157	1.4688							
	I 238-0	4.15 1.4600 1.4631	148-159 159-165	1.4664							
	K 211-4	4.0 1.4634 1.4651	151-161 161-164	1.4603							

## 211—TURPENTINE.

## ANALYSIS.

Ref. Index 1st 25 cc. Distillate.	2nd 25 cc.	3rd 25 cc.	Next 15 cc.	Residue 10 cc.	Residue 25 cc.	DISTILLATION TEMPERATURE OF 90 CU. FROM 100.						Number of Sample.	Remarks, and opinion of the Chief Analyst.							
						Under 150°.	150°-154°.	155°-159°.	160°-164°.	165°-169°.	170°-174°.	175°-179°.	180°-184°.	185°-189°.	190°-194°.	195°-199°.				
63 1 4679	1 4689	1 4694	1 4700	1 4816	.....	3 79	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32 0	39871	Genuine.
52 1 4673	1 4689	1 4699	1 4718	1 4830	.....	15 70	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32 0	39872	"
30 1 4676	1 4683	1 4692	1 4703	1 4870	.....	5 72	10	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	33 0	39873	Doubtful.
54 1 4667	1 4686	1 4698	1 4713	1 4913	.....	18 64	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31 5	39874	"
57 1 4676	1 4697	1 4703	1 4716	1 4933	.....	7 74	7	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	31 0	39875	"
1 4668	1 4690	1 4700	.....	4807	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32 0	35637	Genuine.
38 1 4658	1 4688	1 4700	1 4718	1 4970	.....	2 12	65	8	3	.....	.....	.....	.....	.....	.....	.....	.....	31 5	35638	Doubtful.
57 1 4672	1 4698	1 4704	1 4713	1 4937	.....	7 39	22	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	32 0	35639	"
1 4676	1 4687	1 4694	1 4705	1 4884	.....	3 4	71	10	2	.....	.....	.....	.....	.....	.....	.....	.....	34 0	35640	"
57 1 4667	1 4692	1 4700	1 4718	1 4951	.....	7 75	7	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	32 5	35641	Genuine.
25 1 4584	1 4654	1 4668	1 4666	1 4600	.....	4 11	28	24	8	4	3	2	2	1	1	2	27 5	37853	Contains petroleum.	
0 1 4570	1 4643	1 4660	1 4675	1 4840	.....	6 6	22	22	13	5	4	3	2	1	1	3	34 0	37854	Genuine.	
1 4690	1 4693	1 4710	.....	1 4753	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21 5	37855	Contains petroleum.	
1 4674	1 4686	1 4699	.....	1 4746	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34 0	37856	Doubtful.	
1 4606	1 4683	1 4698	.....	1 4780	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32 0	37857	Genuine.	
1 4610	1 4677	1 4694	.....	1 4769	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23 0	41674	Doubtful.	
5 1 4570	1 4648	1 4663	1 4662	1 4790	.....	5 10	25	24	8	7	2	2	2	1	1	3	24 0	41675	"	
0 1 4572	1 4636	1 4663	1 4650	1 4740	.....	4 9	21	23	12	9	3	2	2	2	1	2	26 0	41676	Contains petroleum.	
5 1 4602	1 4677	1 4696	1 4714	1 4930	.....	6 16	63	15	.....	.....	.....	.....	.....	.....	.....	.....	23 5	41678	Doubtful.	
6 1 4677	1 4687	1 4706	1 4726	1 4873	.....	20 46	16	7	1	.....	.....	.....	.....	.....	.....	.....	36 5	A	Wood turpentine.	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	B	"	"	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	C	"	"	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	D	"	"	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	E	"	"	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	F	"	"	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	G	"	"	
8 1 4688	1 4697	1 4704	1 4713	1 4786	.....	90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	H	Genuine.		
5 1 4664	1 4624	1 4646	1 4663	1 4776	2	9 17	22	16	6	3	5	3	1	1	5	30 5	I	Contains petroleum.		
5 1 4603	1 4640	1 4655	1 4668	1 4830	4	19	21	16	10	10	4	2	1	1	2	35 0	K	"	"	

TABLE II.—TURPENTINE.

somewhat irregular.

TABLE III.

Designation of Sample.	Hull Number.	Residue from 10 cc. $\text{H}_2\text{S}_2\text{O}_4$ .	Fractionation of 100 cc.				Refractive Indices of Fractions and Residues.				VOLUMES OF LIQUID FROM 100 cc.				Flash Point.			
			1st 25 cc.	2nd 25 cc.	3rd 25 cc.	4th 25 cc.	Next 15 cc.	1st 25 cc.	2nd 25 cc.	3rd 25 cc.	Residue.	Res.	Res.	Res.				
A	295.5	1.3	1.4943	1.4704	0.9705	1.25 - 1.60	1.60 - 1.62	1.62 - 1.67	1.67 - 1.76	1.76 - 1.87	1.87 - 1.96	1.96 - 200.	20	46	16	7	1	
B	344.4	1.7	1.4986	1.4678	0.8681	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35.5	
C	317.1	1.9	1.4948	1.4696	0.8664	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
D	331.5	1.9	1.4884	1.4678	0.8670	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
E	349.1	1.65	1.4971	1.4688	0.8700	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
F	20.3	1.6	1.3947	1.4750	0.9465	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
G	247.8	35	1.5013	1.4900	0.9288	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
H	238.0	4.15	1.4600	1.4631	0.8562	148 - 159	159 - 165	165 - 180	180 - 186	186 - 192	192 - 196	196 - 200.	2	917	22	16	6	3
I	211.4	4.0	1.4634	1.4651	0.8562	151 - 161	161 - 164	165 - 177	177 - 206	206 - 208	208 - 211	211 - 215	4.19	21	16	10	4	2
K	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35.	

\* Somewhat irregular.